

Claims

What is claimed is:

1. A method of adapting a speech recognition system, wherein the method comprises steps of:
 - a. obtaining a sample of a speaker's speech during a first remote session;
 - b. recognizing the speaker's speech utilizing the speech recognition system during the first remote session;
 - c. modifying the speech recognition system according to the sample thereby forming a modified speech recognition system;
 - d. storing a representation of the modified speech recognition system in association with an identification of the speaker; and
 - e. using the representation of the modified speech recognition system to recognize speech during a subsequent remote session with the speaker.
2. The method according to claim 1 further comprising a step of cumulatively modifying the speech recognition system according to speech samples obtained during one or more remote sessions with the speaker.
3. The method according to claim 1 wherein the speaker is a telephone caller.
4. The method according to claim 1 wherein the step of modifying the speech recognition system comprises a step of modifying an acoustic model thereby forming a modified acoustic model and wherein the step of storing a representation of the modified speech recognition system comprises a step of storing a representation of the modified acoustic model.

1 5. The method according to claim 4 wherein the representation of the modified
2 acoustic model is a set of statistics which can be utilized to modify a pre-existing acoustic
3 model.

1 6. The method according to claim 4 wherein the representation of the modified
2 acoustic model is a set of statistics which can be utilized to modify incoming acoustic speech.

1 7. The method according to claim 1 further comprising a step of utilizing the
2 modified speech recognition system during the first remote session with the speaker.

1 8. The method according to claim 1 wherein the speech recognition system is
2 speaker-independent prior to the first remote session.

1 9. The method according to claim 1 wherein the step of modifying the speech
2 recognition system is performed during the first remote session.

1 10. The method according to claim 1 wherein the step of modifying the speech
2 recognition system is performed after termination of the first remote session.

1 11. The method according to claim 1 further comprising a step of obtaining the
2 identification of the speaker during the first remote session.

1 12. The method according to claim 11 further comprising a step of authenticating
2 the speaker's identification by the speaker's speech.

1 13. The method according to claim 2 wherein the speech recognition system is
2 speaker-independent prior to the first remote session.

1 14. The method according to claim 2 wherein the step of modifying the speech
2 recognition system is performed during the first remote session.

1 15. The method according to claim 2 wherein the step of modifying the speech
2 recognition system is performed after termination of the first remote session.

1 16. The method according to claim 2 further comprising a step of authenticating
2 the speaker's identification by the speaker's speech.

1 17. A method of adapting a speech recognition system, wherein the method
2 comprises steps of:

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- a. obtaining a sample of a speaker's speech during a first remote session;
 - b. recognizing the speaker's speech utilizing the speech recognition system during the first remote session;
 - c. modifying the speech recognition system according to the sample thereby forming a modified speech recognition system;
 - d. storing a representation of the modified speech recognition system in association with an identification of a cluster of speakers wherein the speaker is a member of the cluster; and
 - e. using the representation of the modified speech recognition system to recognize speech during a subsequent remote session with a member of the cluster of speakers.

1 18. The method according to claim 17 further comprising a step of cumulatively
2 modifying the speech recognizing system according to speech samples obtained during one or
3 more remote sessions with one or more members of the cluster of speakers.

1 19. The method according to claim 17 wherein the speaker is a telephone caller.

1 20. The method according to claim 17 wherein the step of modifying the speech
2 recognition system comprises a step of modifying an acoustic model thereby forming a
3 modified acoustic model and wherein the step of storing a representation of the modified
4 speech recognition system comprises a step of storing a representation of the modified
5 acoustic model.

1 21. The method according to claim 20 wherein the representation of the modified
2 acoustic model is a set of statistics which can be utilized to modify a pre-existing acoustic
3 model.

1 22. The method according to claim 20 wherein the representation of the modified
2 acoustic model is a set of statistics which can be utilized to modify incoming acoustic speech.

1 23. The method according to claim 17 further comprising a step of utilizing the
2 modified speech recognition system during the first remote session with the speaker.

1 24. The method according to claim 17 wherein the speech recognition system is
2 speaker-independent prior to the first remote session.

1 25. The method according to claim 17 wherein the step of modifying the speech
2 recognition system is performed during the first remote session.

1 26. The method according to claim 17 wherein the step of modifying the speech
2 recognition system is performed after termination of the first remote session.

1 27. The method according to claim 17 further comprising a step of
2 identifying the cluster of which the speaker is a member during the first remote session.

1 28. The method according to claim 18 wherein the speech recognition system is
2 speaker-independent prior to the first remote session.

1 29. The method according to claim 18 wherein the step of modifying the speech
2 recognition system is performed during the first remote session.

1 30. The method according to claim 18 wherein the step of modifying the speech
2 recognition system is performed after termination of the first remote session.

1 31. The method according to claim 18 further comprising a step of authenticating
2 the speaker's identification by the speaker's speech.

1 32. A method of adapting a speech recognition system, wherein the method
2 comprises steps of:

- 3 a. obtaining a sample of speech made by each of a plurality of speakers during a
4 corresponding first remote session with each speaker;
5 b. recognizing speech made by each speaker during the corresponding first remote
6 session utilizing the speech recognition system configured to be speaker-
7 independent;
8 c. modifying the speech recognition system according to the sample from each
9 speaker thereby forming a modified speech recognition system corresponding to
10 each speaker;
11 d. storing a representation of the modified speech recognition system
12 corresponding to each speaker in association with an identification of the

- 13 corresponding speaker; and
14 e. using the representation of the modified speech recognition system
15 corresponding to a speaker to recognize speech during a subsequent remote
16 session with the speaker.

1 33. The method according to claim 32 further comprising a step of cumulatively
2 modifying the speech recognition system for each speaker according to speech samples
3 obtained during one or more remote sessions with the corresponding speaker.

1 34. The method according to claim 32 wherein each of the plurality of speakers is
2 a telephone caller.

1 35. The method according to claim 32 wherein the step of modifying the speech
2 recognition system comprises a step of modifying an acoustic model thereby forming a
3 modified acoustic model corresponding to each speaker and wherein the step of storing a
4 representation of the modified speech recognition system comprises a step of storing a
5 representation of the modified acoustic model corresponding to each speaker.

1 36. The method according to claim 35 wherein the representation of the modified
2 acoustic model corresponding to each speaker is a set of statistics which can be utilized to
3 modify a pre-existing acoustic model.

1 37. The method according to claim 35 wherein the representation of the modified
2 acoustic model corresponding to each speaker is a set of statistics which can be utilized to
3 modify incoming acoustic speech.

1 38. The method according to claim 32 further comprising a step of utilizing the

2 modified speech recognition system corresponding to each speaker during the first remote
3 session with the corresponding speaker.

1 39. The method according to claim 32 wherein the step of modifying the speech
2 recognition system for each speaker is performed during the first remote session with the
3 corresponding speaker.

1 40. The method according to claim 32 wherein the step of modifying the speech
2 recognition system for each speaker is performed after termination of the first remote session
3 with the corresponding speaker.

1 41. The method according to claim 32 further comprising a step of obtaining the
2 identification of each speaker during the first remote session with the speaker.

1 42. The method according to claim 41 further comprising a step of authenticating
2 each speaker's identification by the speaker's speech.

1 43. The method according to claim 33 wherein the step of modifying the speech
2 recognition system for each speaker is performed during the first remote session with the
3 corresponding speaker.

1 44. The method according to claim 33 wherein the step of modifying the speech
2 recognition system for each speaker is performed after termination of the first remote session
3 with the corresponding speaker.

1 45. The method according to claim 33 further comprising a step of authenticating
2 each speaker's identification by the speaker's speech.

1 46. The method according to claim 32 further comprising a step of deleting the
2 representation of a modified speech recognition system corresponding to a speaker.

1 47. The method according to claim 46 wherein the step of deleting the
2 representation of a modified speech recognition system corresponding to a speaker is
3 performed when a predetermined period of time has elapsed since the corresponding speaker
4 last engaged in a remote session.

1 48. A speech recognition system comprising:
2 a. an interface coupled to receive a remote session from a speaker; and
3 b. a processing system coupled to the interface to recognize the speaker's speech
4 wherein the processing system is cumulatively modified according to speech
5 samples obtained during a plurality of remote sessions with the speaker.

1 49. The speech recognition system according to claim 48 wherein the speaker is a
2 telephone caller.

1 50. The speech recognition system according to claim 48 wherein the processing
2 system is modified by modifying an acoustic model.

1 51. The speech recognition system according to claim 50 wherein the processing
2 system includes a memory for storing the acoustic model in association with an identification
3 of the telephone caller.

1 52. The speech recognition system according to claim 51 wherein the memory
2 stores a plurality of acoustic models, one for each of a plurality of telephone callers and
3 wherein each acoustic model is stored in association with an identification of the

4 corresponding telephone caller.

1 53. The speech recognition system according to claim 52 wherein the selected ones
2 of the plurality of acoustic models are deleted when a predetermined period of time has
3 elapsed since the corresponding speaker last engaged in a remote session with the voice
4 recognizer.

1 54. A method of adapting an acoustic model utilized for speech recognition,
2 wherein the method comprises steps of:
3 a. obtaining a speech utterance from a speaker during a remote session;
4 b. recognizing the speaker's speech utilizing an acoustic model during the remote
5 session;
6 c. making a determination relative to the speech utterance; and
7 d. only when indicated by the determination, performing steps of:
8 i. modifying the acoustic model according to the speech utterance thereby
9 forming a modified acoustic model; and
10 ii. storing a representation of the modified acoustic model in association
11 with an identification of the speaker.

1 55. The method according to claim 54 wherein the step of making the
2 determination assigns a confidence level to the speech utterance.

1 56. The method according to claim 54 wherein the step of making the
2 determination assigns a confidence level to each of a plurality of portions of the speech
3 utterance.

57. The method according to claim 54 wherein the step of making a determination

2 determines a level of resources available for storing the representation of the modified
3 acoustic model.

1 58. The method according to claim 54 wherein the step of making a determination
2 determines a level of processing resources available for performing the step of modifying the
3 acoustic model.

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